

**TABLE V-12. FINE PARTICLE INDICATOR ( $\text{PM}_{2.5}$ ,  $\text{SO}_4^-$ ,  $\text{H}^+$ ) EFFECTS STUDIES FROM THE U.S. AND CANADA (CD, Tables 13-4, 12-2, 12-13)**

Indicator	RR ( $\pm$ CI) per 25 $\mu\text{g}/\text{m}^3$ PM Increase	PM Levels Mean (Min/Max) <sup>†</sup>
<b>Acute Mortality</b>		
Six City <sup>A</sup>		
Portage, WI	$\text{PM}_{2.5}$	1.030 (0.993, 1.071)
Topeka, KS	$\text{PM}_{2.5}$	1.020 (0.951, 1.092)
Boston, MA	$\text{PM}_{2.5}$	1.056 (1.038, 1.0711)
St. Louis, MO	$\text{PM}_{2.5}$	1.028 (1.010, 1.043)
Kingston/Knoxville, TN	$\text{PM}_{2.5}$	1.035 (1.005, 1.066)
Steubenville, OH	$\text{PM}_{2.5}$	1.025 (0.998, 1.053)
<b>Increased Hospitalization</b>		
Ontario, CAN <sup>B</sup>	$\text{SO}_4^-$	1.03 (1.02, 1.04)
Ontario, CAN <sup>C</sup>	$\text{SO}_4^-$	1.03 (1.02, 1.04)
	$\text{O}_3$	1.03 (1.02, 1.05)
NYC/Buffalo, NY <sup>D</sup>	$\text{SO}_4^-$	1.05 (1.01, 1.10)
Toronto, CAN <sup>D</sup>	$\text{H}^+$ (Nmol/m <sup>3</sup> )	1.16 (1.03, 1.30)*
	$\text{SO}_4^-$	1.12 (1.00, 1.24)
	$\text{PM}_{2.5}$	1.15 (1.02, 1.78)
<b>Increased Respiratory Symptoms</b>		
Southern California <sup>F</sup>	$\text{SO}_4^-$	1.48 (1.14, 1.91)
Six Cities <sup>G</sup> (Cough)	$\text{PM}_{2.5}$	1.19 (1.01, 1.42)**
	$\text{PM}_{2.5}$ Sulfur	1.23 (0.95, 1.59)**
	$\text{H}^+$	1.06 (0.87, 1.29)**
Six Cities <sup>G</sup> (Lower Resp. Symp.)	$\text{PM}_{2.5}$	1.44 (1.15-1.82)**
	$\text{PM}_{2.5}$ Sulfur	1.82 (1.28-2.59)**
	$\text{H}^+$	1.05 (0.25-1.30)**
Denver, CO <sup>P</sup> (Cough, adult asthmatics)	$\text{PM}_{2.5}$	0.0012 (0.0043)***
	$\text{SO}_4^-$	0.0042 (.00035)***
	$\text{H}^+$	0.0076 (0.0038)***
<b>Decreased Lung Function</b>		
Uniontown, PA <sup>E</sup>	$\text{PM}_{2.5}$	PEFR 23.1 (-0.3, 36.9) (per 25 $\mu\text{g}/\text{m}^3$ )
Seattle, WA <sup>Q</sup> Asthmatics	$b_{\text{ext}}$ calibrated by $\text{PM}_{2.5}$	FEV1 42 ml (12,73) FVC 45 ml (20,70)
		25/88 (NR/88) 5/45

References:

- <sup>A</sup>Schwartz et al. (1996a)
- <sup>B</sup>Burnett et al. (1994)
- <sup>C</sup>Burnett et al. (1995) O<sub>3</sub>
- <sup>D</sup>Thurston et al. (1992, 1994)
- <sup>E</sup>Neas et al. (1995)
- <sup>F</sup>Ostro et al. (1993)
- <sup>G</sup>Schwartz et al. (1994)
- <sup>H</sup>Ostro et al. (1991)
- <sup>I</sup>Koenig et al. (1993)

<sup>†</sup>Min/Max 24-h PM indicator level shown in parentheses unless otherwise noted as ( $\pm$  S.D.), 10 and 90 percentile (10,90).

<sup>\*</sup>Change per 100 nmoles/m<sup>3</sup>.

<sup>\*\*</sup>Change per 20  $\mu\text{g}/\text{m}^3$  for PM<sub>2.5</sub>; per 5  $\mu\text{g}/\text{m}^3$  for PM<sub>2.5</sub> sulfur; per 25 nmoles/m<sup>3</sup> for H<sup>+</sup>.

<sup>\*\*\*</sup>50th percentile value (10,90 percentile).

<sup>\*\*\*\*</sup>Coefficient and SE in parenthesis.